

# The Legalization of Marijuana's Impact on Health Care Professionals

National Organization of Alternative Programs  
Albuquerque, New Mexico  
May 16, 2022

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Colorado Physician Health Program



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## No Financial Conflicts of Interest



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## Educational Objectives

1. The Legalization of Marijuana: Colorado's Story
2. Health Care Professionals' Experiences with Patients and MJ
3. Physician Health Programs: MJ use among participants
4. Risk management/malpractice concerns for physicians

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## Efficacy and Safety Passionately Debated!



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## “Rocky Mountain High” Colorado

November 2000

Coloradoans passed Amendment 20:

**A small enterprise was envisioned**

Colorado Department of Public Health and Environment was tasked with implementing and administering the **Medical** Marijuana Registry program

March 2001

Colorado Board of Health approved rules and regulations

June 2001

MMJ Registry began accepting applications for Registry Identification Cards.



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## Rules and Regulations



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## Rules and Regulations

- Patient was previously diagnosed by a physician as having a debilitating medical condition
- Patient was advised by his or her physician, in the context of a bona fide physician-patient relationship, that the patient might benefit from the medical use of marijuana in connection with a debilitating medical condition



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## The Commercialization of MJ

- **February 2009**
  - Obama administration indicated that Medical Marijuana prosecution would have low priority
- **October 2009**
  - Obama administration will not seek to arrest medical marijuana users and suppliers as long as they conform to state laws
- **Applications increased dramatically**
  - September 2009 – 3,523 applications received/month
  - December 2009 – 10,585 applications received/month
  - July 31, 2011 – **127,816** citizens in possession of cards



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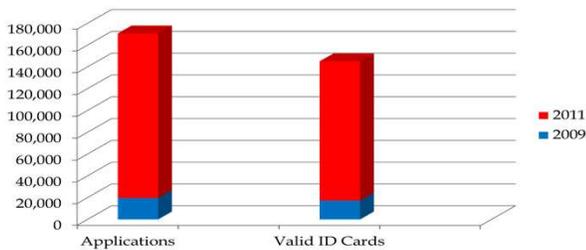
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## Exponential Growth



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## The Passage of Amendment 20

Medical Marijuana Dispensaries Sprouted Like Weeds



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“There are more medical marijuana dispensaries in Denver than Starbucks and liquor stores combined”

The Denver Post



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## MMJ – A Recession Proof Industry

- Marijuana Growers
- Caregivers
- Legal Counsel
- Doctors making recommendations (\$\$\$\$)
- Grow Lights
- Vaporizers
- Pipes
- Edibles
- Advertising (Westword has gone “green”)
- Festivals
- Delivery Services
- Armored Trucks
- Credit Unions?



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## Debilitating Conditions Defined 2022

- Cachexia
- Severe Pain
- Cancer
- HIV/AIDS
- Seizures
- Persistent Muscle Spasms
- Glaucoma
- Autism Spectrum Disorder
- Chronic pain
- Chronic nervous system disorders
- Nausea
- Post Traumatic Stress Syndrome
- Any condition that qualifies for opioid medications.

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## Conditions (April 2014)

- Cachexia 1%
- Cancer 3%
- Glaucoma 1%
- HIV/AIDS 1%
- Muscle spasms 13%
- Seizures 2%
- Severe pain 94%
- Severe nausea 10%



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## Demographic Summary

- 67% card carriers are male
- 41 years is the average age
- 60% card carriers concentrated in metro Denver
- 800 "prescribing" physicians



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Either Colorado experienced an epidemic of severe pain in youthful males or.....

Amendment 20 was exploited by recreational users and financial opportunists



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### SB 109 - 2010

- Defines a bona fide relationship (MD-Patient)
- Physician must have unrestricted medical and DEA licensure
- Addresses physician conflict of interest – physician can not be employed by the dispensary
- Allows medical board to examine care of providers
- Two physicians need to independently examine those patients < 21 years old.

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### Amendment 64

- Ballot initiative to legalize marijuana
- “Medical Marijuana” – A Trojan horse for the legalization of recreational marijuana



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November 6, 2012



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April 20, 2013



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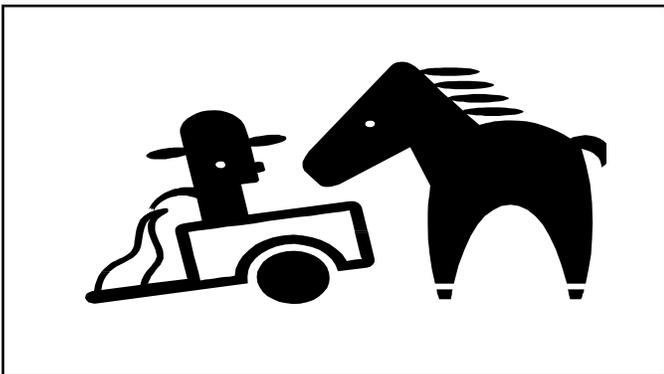
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## Marijuana Remains Illegal on the Federal Level



Governor John Hickenlooper warned that given federal law, the state's residents shouldn't "break out the Cheetos or Goldfish too quickly."



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## Unanticipated Events

- Lawsuits
- Heroin surge
- Persistence of "black market"
- New "gray market" (diversion of legal MJ)
- Persistence of MMJ cards after full legalization
- Tourism and relocations to Colorado
- Homelessness has increased 20-30%
- Increased crime with a "cash only" enterprise
- Environmental impact

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## Post 2013 !

66% of local jurisdictions in Colorado have banned MJ businesses

**NIMBY!**



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What are Health Care Professionals Dealing With?



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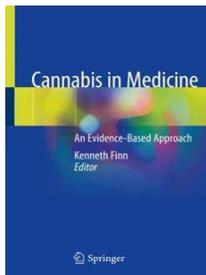
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### Recommended Reading

Published in 2020



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### Potential Benefits of MJ

- Appetite Stimulation
- Reduction of Nausea
- Antispasmodic properties
- Reduction in neuropathic pain
- Reduced IOP in Glaucoma Patients
- Treatment of intractable seizures (CBD not THC)



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## Cannabidiol (CBD)

- Studies suggest:
  - Potential utility in treating psychosis
  - Potential utility in treating addiction
    - Reduction in cigarettes smoked
    - Reduction in opioid seeking behavior
    - Reduction in craving in heroin-dependent patients
  - Potential utility in treating PTSD
    - Anxiolytic
    - Reduces autonomic hyper arousal
    - Consolidation of fear extinction
    - With high doses, sedation to promote sleep



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## Cannabidiol (CBD)

- Studies suggest:
  - No apparent toxic effect
    - Sedation at high doses
  - Promise in treating refractory epilepsy
  - May mitigate hippocampal volume loss
  - Possibly helpful in treating REM sleep/behavioral disorders
  - Possible adjunct to chemotherapies
  - Possibly helpful in decreasing dystonias
  - Possibly helpful in treating neuropathic pain
  - Biphasic response in the immune system
    - Immunosuppression at high doses
    - Immunostimulation at low doses



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## The fact that it is a botanical does not preclude scientific investigation

- Digitalis purpurea – fox glove - CHF
- Papaver somniferum – opium poppy
- Atropa belladonna – nightshade -IBS
- Ephedra sinica – ephedrine - hypotension
- Salix alba – willow tree - ASA
- Taxus brevifolia – Pacific Yew tree – breast cancer



Most physicians remain hesitant/skeptical about recommending MJ

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## Physician Liability

- Paucity of high quality data supporting efficacy
- Little availability of the risks with long-term medical use
- Acceding to patient demands for a treatment on the basis of popular advocacy is atypical practice
- Which cannabinoids, formulations, dosages and routes of administration to use?
- Federal proscription: No FDA oversight



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## More Addiction



**Quit Marijuana The Complete Guide**

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## MJ – A Prescription for Trouble?

- Increased access/availability to a drug
- Increased acceptability of the drug
- Increased use and addiction
- Drug Treatment Admissions 2016:
  - Etoh 13,551
  - MJ 6,720
  - Methamphetamine 5,578
  - Heroin 3,024



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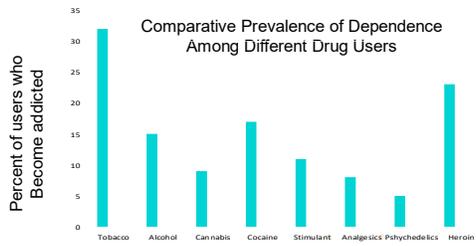
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**Addiction: About 9% of cannabis users may become dependent**



Source: Anthony et al. *Exp. Clin. Psychopharmacology*. 2(3), pp.244-268 (1994)

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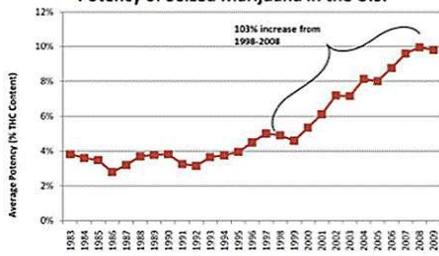
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**Potency of Seized Marijuana in the U.S.**



Source: University of Mississippi, National Center for Natural Products Research, Potency Monitoring Project Quarterly Report 107 (January 2010)

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**Blasting – Dabs (90%)**




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From 2011 to 2013 hospitalizations related to MJ increased by 82% in Colorado



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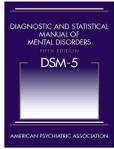
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### Cannabis Withdrawal



- Irritability
- Nervousness
- Insomnia
- Restlessness
- Depression
- Decreased Appetite
- Physical discomfort



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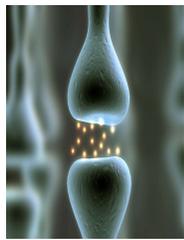
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### Cannabinergic system

- Two main cannabis receptors
- CB1 – present throughout CNS
  - Hippocampus (short term memory)
  - Cortex
  - Olfactory areas
  - Basal ganglia (motor activity)
  - Cerebellum (motor coordination)
  - Hypothalamus/Limbic (appetite/sedation)
  - Spinal cord
- CB2 – located peripherally, linked with immune system
  - Spleen
  - Immunologic cells (B lymphocytes, natural killer cells)



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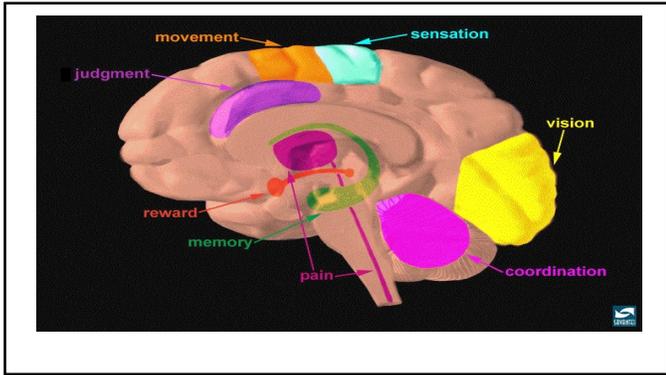
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- THC receptors are sparsely populated in the human brain:  
A. True  
B. False

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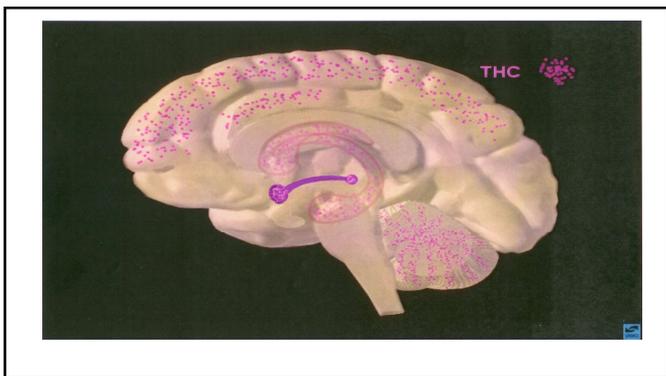
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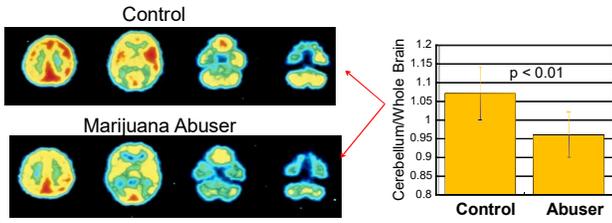
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### The Lower Baseline Cerebellar Metabolism in Marijuana Abusers is likely to Result in Motor Deficits



Source: Volkow et al., Psychiatry Research: Neuroimaging, 67, pp. 29-38 (1996).

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### Marijuana and Cognitive Impairment

Messinis et al. Neurology 2006;66:737

- Use of 4 joints or more per week resulted in a decrement in mental test performance, subjects who smoked regularly for a decade or more did the worst
- Long-term marijuana users were impaired 70% of the time on a decision making test, compared to 55% for short-term users and 8% for non-users



FMX

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### DRIVING UNDER INFLUENCE

More Accidents and Fatalities



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## Unanticipated Popularity of Edibles



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## Metabolism of Marijuana

- Massive first pass metabolism via the oral route – only 10-20% reaches systemic circulation unchanged – takes 30 – 60 minutes to achieve an effect – key side effect on CNS can be dysphoria rather than euphoria
- Via the lungs – onset of action within seconds – “**high**” experienced with serum concentration of **3 ng/ml**, produced by as little as 2-3 mg D9-THC, average “joint” contains 0.5 – 1.0 g of cannabis

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## Negative Consequences of Edibles

- Deaths from Edibles (Psychosis)
- Child Exposures and Toxicity  
From 2006 to 2013, child exposure to MJ increased by 268%
- Animal Exposures and Toxicity  
Four fold increase in poisoned pets since 2008



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## Butane (Infused) Hashish Oil - BHO



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Butane cans and a mind altering substance; what could go wrong?

(Serious Burns Requiring Skin Grafting)

2014: 24 extraction lab explosions and 27 serious injuries



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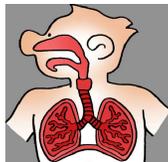
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## Known Negatives of Using MJ

- Pulmonary problems

- Cancer? (Studies are equivocal)
- Increased Airway Resistance
- Hyperinflation of Lungs
- Chronic Bronchitis
- Increased Rates of Infection



Volkow et al, NEJM 2014

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## Smoked Cannabis

- ☑ Smoking cessation campaigns in progress!
- ☑ Tobacco and Cannabis contain approximately 4000 identical chemicals
- ☑ Noxious compounds:
  - Tar
  - Carbon Monoxide
  - Polycyclic Aromatic Hydrocarbons

Henry and Colleagues, BMJ 2003



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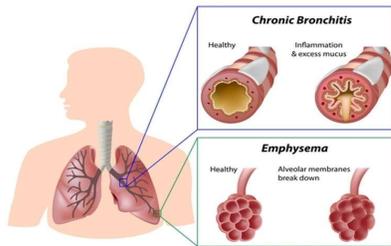
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## Known Complication of Smoking Is the risk the same for Vaping?

Chronic Obstructive Pulmonary Disease (COPD)



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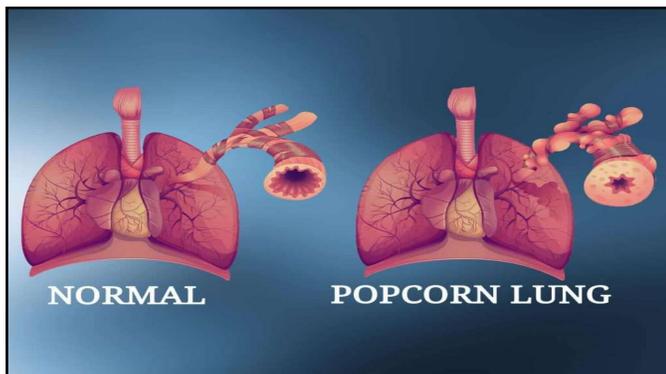
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## Bronchiolitis Obliterans aka Popcorn Lung

- Popcorn lung, or [bronchiolitis obliterans](#), is a disease that affects the smaller airways in your lungs called bronchioles.
- It can cause scarring and narrowing of these important airways, leading to wheezing, shortness of breath, and coughing.
- Other conditions that have been linked to popcorn lung include [rheumatoid arthritis](#) and [graft-versus-host disease](#), which happens after a lung or bone marrow transplant.
- **Diacetyl is the culprit** and has been removed from the production of popcorn.

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## Burns Related to Vaping

### Unintended Injuries



1X

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## Known Negatives of Using MJ

- Cardiovascular Problems
  - An association between MJ inhalation and higher (2X) rates of acute myocardial infarction (tachycardia) [www.rmhidta.org](http://www.rmhidta.org)
  - An association with increased cardiovascular mortality (vessel injury)  
Thomas et al, Am J Cardiol 2014



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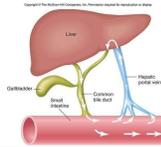
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## Known Negatives of Using MJ

### • Hepatic Complications:

- Smoking MJ daily is a risk factor for progression of liver fibrosis in Hep C patients

Hezode C et al, Hepatology 2005



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## Known Negatives of Using MJ

### Cannabinoid hyperemesis syndrome:

- Cyclic nausea and vomiting
- Compulsive bathing
- Expensive medical workups



Chen J et al, Current Psychiatry 2013

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## Known Negatives of Using MJ

### Reproductive Health: Longterm Use of MJ:

- Suppresses oogenesis
- Impairs embryo implantation and development
- Associated with testicular atrophy
- Associated with abnormal sperm motility



Barazani Y et al, Urol Clinics North America, 2014  
Bari M et al, Urol Clinics North America 2014

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## Known Negatives of Using MJ

☐ It crosses the placental barrier

- Small for gestational age infants
- Inattention
- Hyperactivity
- Memory and Learning Problems
- These persist into adolescence
  - Lower academic achievement



Gray TR et al, Clin Chem, 2010 and Wu CS et al, J Future Neuro, 2011

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## Known Negatives of Using MJ

- Neurotoxic to the adolescent brain
  - Regular heavy use associated with reduced IQ (8 pts)
  - Interferes with new learning and memory
  - Accelerates the onset of psychosis in the vulnerable
  - Amotivational Syndrome
  - Primes the brain for addiction
    - 1 in 6 become addicted if use starts in childhood
    - Likely a gateway drug because of high potency THC

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## Known Negatives of Using MJ

Central Nervous System Insults:

☐ Volume diminution:

- Hippocampus
- Amygdala
- Cerebellum



Matochik JA, Drug Alcohol Depend, 2005

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## Known Negatives of Using MJ

### Psychiatric Complications:

- ❑ Prospective cohort study
- ❑ N = 1000
- ❑ Followed from birth to age 38 years
- ❑ Neuropsychological functioning not fully restored in adolescent users
- ❑ Is THC medical?



Schatman M, Medscape 2015

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## Known Negatives of Using MJ

### Psychiatric Complications:

- ❑ Related to THC not CBD
- ❑ High prevalence of Anxiety Disorders
- ❑ Increased risk for depression and suicide
- ❑ Psychosis
- ❑ Cognitive Impairment
- ❑ Structural Changes to the integrity of the brain



Schatman M, Medscape 2015

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## Spoiler Alert!



The Colorado Physician Health Program has seen very few Health Care Professionals with Marijuana Use Disorders

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• In Colorado, employers cannot fire employees who use medicinal marijuana as long as it is used away from the workplace premises and not on company time:

- A. True
- B. False

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### Coats v. Dish Network



- Brandon Coats used MMJ for spasticity
- Colorado Supreme Court upheld the firing of Mr. Coats by Dish Network for testing positive for THC
- Mr. Coats sued, claiming lawful use of MJ under Colorado law
- But Colorado's Supreme Court ruled 6-0 that the firing of Coats was legal.
- The Court relied on federal law which holds the use of marijuana to be illegal. (i.e. the "Supremacy Clause which trumps state law)
- In Colorado, companies can either fire, or not hire workers based on drug use off the work premises, and on their own time!

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### Physician MMJ Recommendations

- In the fall of 2009 @ 900 doctors had written approval letters (7% of licensed MDs)
- 15 doctors – 72% of recommendations
  - 5 of these 15 doctors have had disciplinary histories
- 5 doctors – 50 % of recommendations
- One doctor signed over 7000 certificates in a two year period
- Medical Board is cracking down on physicians



(This information was provided by former Attorney General John Suthers)

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- The marijuana metabolite THC-COOH can be detected in the urine for:
  - A. 3 to 5 days
  - B. 2 weeks
  - C. For several months in heavy users

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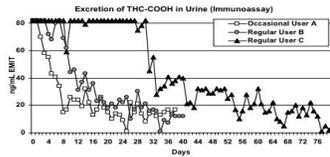
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## Hospitals Frequently Test Physicians

### Urine Testing - Regular Use



(F. Grotenhemmer, Cannabiskonsum, Straßenverkehr und Arbeitswelt; from GM Ellis et al., Excretion patterns of cannabinoid metabolites after last use in a group of chronic users. *Clin Pharmacol Ther* 1985;38(5):572-578.)

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- The percentage of physicians making marijuana recommendations in Colorado is:
  - A. Less than 10%
  - B. 25%
  - C. 50%
  - D. 90%

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## Deterrents to Physicians Recommending MJ

- Conservative professionals
  - Training to examine science that supports efficacy and safety
  - Oath to do know harm
- Fearful of the Drug Enforcement Agency
  - Schedule I drug
  - Federal law proscriptive
  - Negative Consequences
    - Discipline
    - Loss of federal funding (Medicare, research grant monies, etc.)
- Hospitals are adopting Zero Tolerance Policies
  - Fear of job loss
- The literature is replete with known negatives of MJ use
  - Most funding for research is related to addiction



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## Most Physicians are Cautious

- Unusual route of administration of a drug (i.e. no FDA approved drug is smoked!)
- Contradicts movement toward practicing evidence based medicine
- Abrogation of the role of the FDA
  - Evidence of efficacy and safety
  - Concerns about potency and purity (unregulated)
  - MJ bypassed scientifically based drug approval procedure
  - No standards for therapeutic dosing
  - No post marketing surveillance
  - Drug-drug interactions?
- MJ has bypassed the Colorado Prescription Drug Monitoring Program



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## Effects of Marijuana Intoxication and Pilot Performance

Am J Psychiatry 1985;142:1325-1329

- Ten experienced licensed private pilots trained for 8 hours on a flight simulator landing task
- Each smoked a THC cigarette (19 mg)
- 24 hours later their mean performance on the flight task showed trends toward impairment in all variables, some tasks showed significant impairment
- Despite the deficits, the pilots reported no awareness of impaired performance



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## Physicians Recommending Medical Marijuana

- Maintain adequate malpractice coverage
- Be able to diagnose Substance Use Disorders
- Engage in continuing education  
(No certification available for MMJ practice)
- Only practice within one's scope of expertise
- How do you develop the expertise with so little science?

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## Closing Thoughts

- Need to dispassionately study the therapeutic properties of MJ's many compounds separately
- Develop delivery systems that are less prone to abuse
- Approving medications by ballot initiatives and state legislative actions sets a dangerous precedent for public health
- This is a social experiment. It will take decades to understand the impact on human beings, the environment and society at large.
- Commercialization of THC has followed the path of BIG TOBACCO

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